



**The
Board of Inspection and Survey
INSURV**



ELECTRICAL INSPECTION GUIDE

SSN 688 CLASS

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In-Brief & Initial Discussion with Ship's Force:

1. **SAFETY & UNDERSTANDING**: We do not want to do anything unsafe. If you have concerns regarding anything you are asked to do, resolve it prior to performing the evolution. The intent and expected outcome of the evolution should be explicitly known to all personnel involved.
2. **CLOSEOUT INSPECTIONS**: INSURV is a busy time and can be very fast paced. **Ensure that your equipment closeout inspections are performed properly.** EPMs have been seriously damaged and put OOC due to inadvertently leaving brushes out, hanging by their pigtails, after the open & inspect evolution. **BE CAREFUL & BE THOROUGH !**
3. **MRC REFERENCES**: This IG periodically references MRCs. The MRCs are to be used as a guide to perform the inspection – the intent is not to perform these particular PM items.
4. **S/F REPRESENTATIVE**: Throughout the inspection, an E-Div representative of sufficient seniority and knowledge is to accompany me. That means getting him off of the watchbill for the duration of the inspection period. Based on previous experience, your best candidate is the E-Div LPO, supplemented by the next senior electrician when the LPO gets called away for non-inspection related issues. This facilitates several key factors:
 - **SAFETY**: This is particularly important when doing inspections in the vicinity of energized gear.
 - **Experience**: Someone of sufficient background/knowledge to answer questions that come up.
 - **Authority**: Someone of sufficient horsepower to make things happen expeditiously if needed, ie. conditions to be established, tagouts to be prepared, etc.
 - **Understanding**: Someone of sufficient responsibility and authority who will be intimately familiar with and understand all deficiencies, reducing questions and confusion later on.
 - **Informing Higher Authority**: Someone of sufficient authority and responsibility who will telegraph significant deficiencies up the Ship's Force chain of command for appropriate action.
5. **NO SECRETS**: Keep INSURV informed of significant issues that arise.
6. **ENERGIZED INSPECTIONS**: Need **blanket permission** from the CO to perform **not-to-break-the-plane** open & inspect on energized gear (usually motor controllers, switchboards, fuse panels, etc.). Explain your required safety precautions.
7. **SWITCHBOARDS**: **BEFORE WE START SWITCHBOARD INSPECTIONS**, start the time-consuming switchboard inspection preparations: (unscrew) cover panels, leaving each cover panel held on with two to four fasteners, finger tight.
8. **THERMAL IMAGING**: We will conduct thermal imaging in conjunction with visual inspections.
9. **KEEP MOVING !**: Keep thinking several steps ahead. There is a lot to inspect, and we do not want to be standing around waiting for system status to be set or tags to be hung to perform an inspection.
10. **FRONT-LOADING**: If it is possible to conduct evolutions earlier in the inspection than originally planned, do so. Also, if there is an evolution/inspection that is scheduled for the last day, get it ready as soon as possible.
11. **DC MOTORS / SSMG INSPECTIONS**: Tagout, pull 1 brush from each AC end slipring, pull 1 brush from 2 different brush tracks, open overspeed unit if applicable.
12. **SSMG INSPECTIONS**: Do **not** interfere with Diesel Trend Analysis. You need to coordinate with the Auxiliary Inspector and Ship's Force Trials Coordinator to determine when to take down the SSMGs.
13. **SSMG O/S TRIP**: We will perform one overspeed trip test of a SSMG. If this test is SAT there is no need to overspeed the second SSMG. Test the overall system, do not isolate contacts. If the first SSMG fails, we will do both.

14. **EPM & SPM OPERATIONS:** E-Div LPO ensure the Ship's INSURV Trials Coordinator knows the specific requirements for EPM & SPM operations as follows:

Operation of the EPM: (Perform in the order written.)

2 minutes astern at maximum bell, **do NOT put stern way on the ship**

2 minutes (minimum) ahead at maximum bell

Note: The EPM open and inspect should be done underway since the reduction gear inspection tent interferes with access to the EPM and is set up shortly after return to port.

Operation of the SPM: Lower, Run for 2 Minutes, Secure

15. **COORDINATION:** Coordinate with other divisions and inspectors for various evolutions.

Electrical Evolution	Other Evolutions	AX	MS	WP	MP
Sound Cuts	Sonar/Plant conditions			X	X
Tagout PLO/MLO for Inspection	Interferes with Reduction Gear Inspections & Lube Oil Standby Checks				X
Tagout Trim Pump for Inspection	Trim Pump Strainer Inspections	X			
Tagout Drain Pump for Inspections	Drain Pump Strainer Inspections	X			
Inspect/Overspeed SSMGs	Conflicts with Diesel Trend Analysis	X			
EPM Operations	Clutch Operation Inspections				X
Deep Fat Fryer High Temperature Test	Inport O/I day (NAVOSH inspector)		X		
APC System Pressure Switch Test	Inport O/I day – Cooking		X		
DC Lighting	Do with Reactor Comp Inspection				X

16. **ELECTROSTATIC PRECIPITATORS:** Test electrostatic precipitators IAW applicable PM cards and provide results to me. Be sure to indicate the specification current and voltages. Circle the UNSAT readings. Be sure the numbers recorded are the readings taken before any adjustments are made.
17. **BATTERY:** Ensure the battery is charged prior to the Board's arrival. We do not want to perform any battery charges during the inspection, particularly during the underway portion.
18. **ADMIN:** Provide the Battery Record Book and Degaussing Folder to the Electrical Inspector.
19. **S/F TESTING/INSPECTIONS:** Perform the following tests and inspections the week prior to the inspection and provide the results to the INSURV Inspector upon his arrival.
- Cable Repair Kit Inventory - Provide list of items that are not present.
 - CO-H₂ Burner High Temperature Shutdown Test - Provide results (SAT/UNSAT)
 - Shorting Probe Inspections - Provide list of deficiencies.
 - Spare Fuse Stows - Look for Chase-Shawmut Amptap fuses and other prohibited fuses (solder tipped); provide results.
20. **DC LIGHTING:** Energize DC Lighting in conjunction with both the Senior Member Habitability Inspection (Early Day 1) and the MP Inspector during performing the Reactor Compartment inspection (Open and Inspect Day).
21. **SWITCHBOARD, CONTROLLER, AND EQUIPMENT INSPECTIONS:** Below is a general list of switchboards, controllers, and equipment that will be inspected during the MI. For a more detailed list of equipment, please send an e-mail to LCDR White at shawn.e.white@navy.mil.

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Equipment	
EPCP	HPAC Cntrls
Switchboard 3B series	CO2 Scrubber Cntrls
Switchboard 4B series	CO-H2 Burner Cntrls
Switchboard 1S series	CO-H2 Burner Cntrls High Temp S/D tests
Switchboard 2S series	Vent Fog Precipitators
Switchboard 3S series	Vent Heater 46, 47 Temp Cntrls
Switchboard 4S series	Shaft Grounding Device
Switchboard 5S series	Ultrasonic Sink
Switchboard 6S series	Battery Well / ICV Panel
SSMG 500 KW, 60 Hz, Cntrls, Regs	Ultrasonic Sink & Cabinet
SSMG Starter Cabinets	Submersible Pumps
SSMG Bearing Changeout Tools	EPM Ctrl / EPM Operational Test
SSMG Special Cleaning Gear	SPM Operational Test
SSTG Governor Cntrls	Clothes Washer / Dryer
Arc Fault Detector Test	Inspect Shorting Probe
Distribution Panels (various)	ADMIN: Battery Book, Degaussing Folder
FWD/AFT Shore Power Connections	
MSW Cntrls	
ASW Cntrls	Tagouts
RPFW Cntrls	SSMGs
ERFW Cntrls	SSTG Collector Housings
TG LO Cntrls	Diesel Generator Collector
PLO Cntrls	EPM Motor
LO Purifier Heater Cntrls	Trim Pump Motor
Steering & Diving Cntrls	Drain Pump Motor
Ships Service & Stern Diving Hyd Cntrls	DC PLO Pump Motor & Cntrls
Trim/Drain Priming Pump Motor Cntrls	43 KW 400 Hz MG, Cntrls, Regs
Trim/Drain Pump Cntrls, resistors	Clothes Dryer